NEBRASKA STATE FIRE MARSHAL
OFFICIAL INTERPRETATION

Interpretation Number: 01-01

Date: 01 February 2007

Pamphlet Number: NFPA 99, 2002 ed.

Section(s): 19.3.9

Comments:
Personal Care includes daily contact by the facility management of the resident's functioning and well-being. Supervision of nutrition and medication is also included.

Question: What are the requirements for oxygen storage and cylinder filling for residential occupancies?

Response: Individuals who live in an independent setting, with no "Personal Care" provided are not subject to the oxygen storage/usage requirements of NFPA 99.

Where personal care is provided, responsibility for the safety of the resident is given to the facility, and management of oxygen systems must be handled by the facility. In these facilities, oxygen storage and container filling must be conducted in accordance with NFPA 99. A memo detailing storage/filling is attached to this interpretation.

Facilities where oxygen is regulated include hospitals, nursing homes, assisted living facilities, and independent living facilities where personal care is provided. A private residence or apartment where the resident receives care from a relative is not covered by these regulations.

Storage requirements apply to oxygen cylinders and containers that are not actively in use. A container that is used to fill small, portable oxygen equipment but is also used when the resident is in the dwelling unit is considered "in use". Spare cylinders or containers are considered as storage.

Where personal care is provided, the resident is not permitted to transfill containers within a dwelling unit unless an approved filling room is provided as specified in the attached memo.

Signature: John E. Falgione **Date:** 02/01/07

Title: John E. Falgione, State of Nebraska Fire Marshal

STATE OF NEBRASKA

MEMORANDUM

Dave Heineman
Governor

STATE FIRE MARSHAL
John Falgione
Fire Marshal

To: State Fire Marshal Health Care Inspectors
Delegated Authorities

From: Doug Hohbein
Chief Plans Examiner

Date: June 14, 2007

Re: **Oxygen in Health Care Occupancies**

The 1999 edition of NFPA 99, *Standard for Health Care Facilities* lists several requirements for oxygen systems. The purpose of this memo is to clarify requirements for the storage of compressed and liquid oxygen as well as the transfer of liquid oxygen between containers. The requirements listed apply to freestanding cylinders and containers used individually and not to piped oxygen systems or manifolded cylinders. Oxygen that is considered in use is not covered by these requirements. **Storage of up to 300 cubic feet of oxygen (up to 12 "E" sized cylinders) is permitted without regulation. The following requirements do not apply for up to 300 cubic feet of oxygen storage per smoke compartment.**

The requirements below apply to the storage of more than 300, but less than 3000 cubic feet of oxygen as noted in section 8-3.1.11.2.

Storage Only, 301 to 3,000 Cubic Feet

1. Cylinders and liquid oxygen containers shall be stored outdoors or in an enclosure of noncombustible or limited combustible construction with lockable doors. No fire rating of the room is required.
2. Oxygen shall not be stored with any flammable gas, liquid or vapor.
3. Cylinders shall be separated from combustible materials (storage) by
   a. 20 feet; or
   b. Five (5) feet if the space is fire sprinkler protected; or
   c. Cylinders shall be stored in a noncombustible cabinet providing at least a ½ hour fire rating such as a properly labeled flammable liquid storage cabinet.

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4. Liquid oxygen storage rooms or enclosures shall be vented to the outside by a dedicated mechanical ventilation system or by natural venting. The open venting area to the exterior shall be at least 72 square inches if natural venting is used.
5. Cylinders and containers shall not be exposed to conditions that will raise the temperature of the cylinder or container above 130^0F.
6. Ordinary electrical wall fixtures in storage rooms shall be installed at least 5 feet above the floor to avoid physical damage.
7. Cylinders shall be protected from abnormal shock. Storage near elevators or in locations where heavy moving objects will strike them or fall on them is prohibited.
8. Freestanding cylinders shall be properly chained or supported in a proper cylinder stand or cart.
9. Smoking, open flames electric elements and other sources of ignition shall be prohibited within storage locations or within 20 feet of outside storage locations.
10. Signage shall be provided on each door or gate of the oxygen storage room or enclosure. The sign must be readable from a distance of 5 feet and shall include the following language:

CAUTION
OXIDIZING GAS(ES) STORED WITHIN
NO SMOKING

11. Cylinder-valve protection caps shall be used, when provided.

The following requirements apply to storage locations of freestanding oxygen cylinders and liquid oxygen containers of more than 3,000 cubic feet of total storage. The requirements are found in section 8-3.11.1

Storage Only, >3,000 Cubic Feet

1. Cylinders and containers shall not be exposed to conditions that will raise the temperature of the cylinder or container above 130^0F.
2. Storage rooms or enclosures shall be one-hour fire rated with a 45 minute rated self-closing door(s). The room can be used for full or empty cylinders, but can be used for no other purpose. Storage of flammable or combustible gas cylinders or other storage is not permitted in the same room.
3. Provisions shall be made for racks or fastenings to protect cylinders from accidental damage or dislocation. Wooden racks are acceptable.

4. Electrical service in the room must meet NFPA 70, the *National Electrical Code* for an ordinary location. Wall fixtures, switches and receptacles shall be installed at least 5 feet above the floor to protect against physical damage.
5. Cylinder-valve protection caps shall be used, when provided.
6. Compressed and liquid oxygen storage rooms or enclosures shall be vented to the outside by a dedicated mechanical ventilation system or by natural venting. The open venting area to the exterior shall be at least 72 square inches if natural venting is used.

The following requirements apply to the transfer of liquid oxygen regardless of container size or quantity transferred. All of the items listed below must be met to allow indoor liquid oxygen transfer. Transferring shall be conducted at a specifically designated location. The requirements are found in section 8-6.2.5.2

Transfer of Liquid Oxygen

1. The room must be separated from any portion of a facility where patients are housed, examined or treated by a one-hour fire rated barrier with a 45 minute rated self-closing door(s).
2. The room is mechanically vented.
3. The room is fire sprinkler protected.
4. The room has ceramic or concrete flooring.
5. The room is posted with signs indicating that transferring is occurring, and that smoking in the immediate area is not permitted.

In accordance with CGA Pamphlet P-2.6, *Transfilling of Low-Pressure Liquid Oxygen to be Used for Respiration,* transfilling should be conducted only by trained, qualified personnel who are familiar with the hazards and equipment being used.

To assist in the amount of storage present, the following information may be helpful.

98.75 liters of liquid oxygen = 3,000 cubic feet of gaseous oxygen.
26.06 gallons of liquid oxygen = 3,000 cubic feet of gaseous oxygen.
248.43 pounds of compressed oxygen = 3,000 cubic feet of gaseous oxygen.